UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

SR- 6J

August 27, 2014

Mr. Chase Fortenberry
Georgia-Pacific LLC
133 Peachtree Street NE
Atlanta, GA 30303

RE: Area 3: Draft Supplemental Remedial Investigation Report Preliminary Comments

Dear Mr. Fortenberry:

The U.S. Environmental Protection Agency (EPA) has completed an initial review of the Area 3 draft Supplemental Remedial Investigation (RI) report, submitted on March 28, 2014, for the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. The RI report presents the data evaluation and the nature and extent of contamination for Area 3 of the Kalamazoo River from the Otsego City dam to the Otsego Township dam.

As with the Area 2 RI report, the Area 3 draft RI report does not clearly define the path forward for addressing the non-PCB constituents detected during the RI sampling activities. A non-PCB white paper is scheduled to be submitted to EPA in September to address this issue. The conclusions of the non-PCB white paper will need to be incorporated into the Area 3 RI report and the document rewritten. Rather than continue to review the document, EPA has provided some draft comments on the report. Georgia Pacific should revise the Area 3 RI report incorporating both the results of the non-PCB white paper as well as addressing EPA's enclosed preliminary comments. After receiving the revised report, EPA will fully review the (revised) draft Area 3 RI report.

The draft Area 3 RI report must be submitted (60) sixty days after receipt of EPA's comments on the non-PCB white paper.

Please contact me at (312) 886-0992 if you have any questions regarding this matter.

Sincerely,

James A. Saric
Remedial Project Manager
SFD Remedial Response Branch #1

Enclosure

cc: Paul Bucholtz, MDNRE
Garry Griffith, Georgia-Pacific
Richard Gay, Weyerhaeuser
Jamie McCarthy, KRWC

U.S.EPA COMMENTS ON THE AREA 3 SRI ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SITE

GENERAL COMMENTS

GENERAL COMMENTS

Commenting Organization: USEPA **Commenter: White**
General Comment #: 1

The Final Area 3 Field Sampling Plan (September 2012) describes a geomorphology-based soil sampling program to provide data representative of different geomorphic strata. However, the presentation of the floodplain soil data in the SRI report does not differentiate between floodplain geomorphic strata, and the PCB concentration interpolation does not take geomorphology into account. Elevation and vegetation type also may inform the interpretation of floodplain PCB distribution (i.e., forest versus wetland). In particular, the interpretation of the PCB distribution in floodplain soils on the right bank north of the Pine Creek impoundment as shown in the Figure 4-9 series could be improved by taking geomorphology, elevation and vegetation type into account.

Commenting Organization: USEPA **Commenter: White**
General Comment #: 2

The SRI report provides a lot of information to refine our understanding of the potential transport of PCB-contaminated sediments and floodplain soils. In particular, it highlights the fact that bank erosion processes (e.g., freeze/thaw processes, undercutting and sloughing, etc.) are of greater importance than bed or floodplain surface erosion.

The document must provide the path forward to complete the evaluation, for example:

SRI: conclude based on erosion pin data and hydro modeling that bank erosion is a significant process that results in transport of PCB-contaminated soils and sediments from Area 3 to downstream areas
FS: delineate bank areas to be targeted for either removal or stabilization (they would have to delineate these areas using existing data; presumably based primarily on PCB concentration since the incomplete characterization of bank erosion processes would not allow any areas to be ruled out based on stability)
RD: further characterization of bank erosion processes and rates to support design of removal or stability measures

Commenting Organization: USEPA **Commenter: White**
General Comment #: 3

Although a description of the nature and extent of contamination in the Pine Creek Impoundment is included in Section 4, a SWAC was not developed and the impoundment is not included in the conceptual site model in Section 5. The PCB contamination in the former Pine Creek Impoundment needs to be more fully integrated into the CSM and report conclusions.

Commenting Organization: CH2M HILL **Commentor: Mitchell**
Section:4 **Page #:** **Lines #: NA**
General Comment #: 4

Delete all references to the calibrated hydraulic model. No calibration has been performed and it is misleading to refer to it as having been calibrated.

SPECIFIC COMMENTS

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: iv** **Lines #: NA**
Specific Comment #: 1

Third bullet from the top, the report states:

> *"In the downstream subarea, shear stresses and velocity are likely to increase slightly in some locations as a result of dam removal and lowered water levels, but the effect is largely compensated by the removal of lacustrine sediments and a no dam channel morphology that is considered to be approximately in equilibrium with the flows.*

Several points made here need clarification:

- The velocities and shear stresses will increase and more than slightly. The shear stress values will increase even more than reported in this report due to coarsening of the substrate which was not accounted for in the modeling (but should have been). Language should be stronger since this a certain outcome.
- Please clarify the last part of this sentence. How does removal of the lacustrine sediment and post dam morphology compensate for large increases in velocity and shear stress? Removing the sediment steepens the slope and post-dam morphology should include a narrower channel with more flow resistance, all of which will increase velocity and shear stress, not reduce it.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: iv** **Lines #: NA**
Specific Comment #: 2

Third bullet from the top, last sentence, text states:

"Under the dam-out scenario, inundated floodplain areas are likely to be reduced, but are accompanied by relatively higher water velocities and shear stresses."

Please clarify that both the frequency and flooding extent are reduced.

Commenting Organization: USEPA **Commenter: White**
Section: 1.1 **Page #: 1-1** **Lines #: NA**
Specific Comment #: 3

Add a bullet under the third bullet ("*Summarize investigative activities*") that states "Describe the physical characteristics of Area 3."

Commenting Organization: USEPA **Commenter: White**
Section: 1.2.1 **Page #: 1-2** **Lines #: NA**
Specific Comment #: 4

Second paragraph: "*The interconnection and potential for PCBs to migrate into Pine Creek is the reason that a portion of the Pine Creek impoundment is included in the Area 3 SRI/FS…*" The report should indicate whether PCBs still have the potential to migrate from the Kalamazoo River into the impoundment, or if this a historical (pre-control structure) transport pathway only.

Commenting Organization: USEPA **Commenter: White**
Section: 3.5.2 **Page #: 3-4** **Lines #: NA**
Specific Comment #: 5

Second paragraph: historical information about the Otsego Dam and Pine Creek impoundment was presented in Section 1.2.1 and does not need to be repeated here.

Commenting Organization: USEPA **Commenter: White**
Section: 3.5.2.1 **Page #: 3-5** **Lines #: NA**
Specific Comment #: 6

The first paragraph states that the average slope along the Area 3 channel is about 4.6 feet/mile; the first full paragraph on page iii and the first paragraph in Section 3.7.2 state that the average bed slope is 2.5 feet/mile. Which value is correct?

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #:3-6** **Lines #: NA**
Specific Comment #: 7
First paragraph. This prediction is now 9 years old - are you able to comment on how well the model predictions have held up? That may shed light on how reliable the model is and whether it can serve as a useful predictive tool in the future (should it be updated?). Bank erosion models such as BSTEM are great tools for modeling bank erosion processes – they are much more reliable than using a 1D or 2D hydraulic model.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 3-12** **Lines #: NA**
Specific Comment #: 8

In the last paragraph. Please delete the reference to water quality modeling since it was not performed at this site.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 3-13** **Lines #: NA**
Specific Comment #: 9

In the paragraph following the bullet points…
The scenario described here does not at all reflect reality and therefore doesn't provide any meaningful information. Contaminated sediments on the floodplain are covered by vegetation and the grain shear force exerted on them is much lower than the total bed shear stress predicted by the model. The critical shear strength of a vegetated surface can be an order of magnitude larger than the critical shear stress for a single non-cohesive sediment particle and the form drag component of the total bed shear can reduce the shear stress by 50 percent or more. These two factors must be considered for the comparison to be of any value. There is a vast amount of literature data to reference for critical shear stress values for vegetated surfaces and many methods for partitioning the total shear stress. If these first order controls on erosion are not accounted for then the analysis should not be performed.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 3-14** **Lines #: NA**
Specific Comment #: 10

Second bullet from the bottom – text states:

> *The channel n-values varied between 0.02 and 0.07 and were taken as-is from the n values determined by the USGS for this reach (Syed, 2005)*

This is a wide range - why would the roughness values vary so greatly over such a short and uniform reach? Also, state how they were developed and why they are being used (instead of developing independent estimates based on recently collected data). The channel roughness should be a function of the particle size and channel form and should

not have abrupt changes in roughness without a physical reason for it. This has critical implications for the shear stress analysis described later in this report.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 3-15** **Lines #: NA**
Specific Comment #: 11

Section 3.8.1.1 second paragraph describes the integration of the bathymetry and LiDAR data. The average spacing between transects is about 100 meters. Please describe how the bathymetry was interpolated between transects.

Furthermore, the implications associated with using a 4 meter model grid when the survey data are spaced at 100 meter needs to be discussed somewhere in this report, especially in the context of interpreting results. In short, the spatial distribution of model outputs in the channel should not be relied upon since it is based on interpolated data, not actual survey data. The model should be thought of as being a 1D model in the channel and 2D in the floodplains. The model cannot predict the spatial distribution of velocity or shear stress except at the survey transects. Many of the interpretations later in this report are being made on model results which are not based on any survey data and should not be presented as model predictions.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 3-16** **Lines #: NA**
Specific Comment #: 12

Section 3.8.2.1, second paragraph. Please describe the flow control structure at the Pine Creek tributary and its flow capacity. Does it have the capacity to pass all the flows listed for Pine Creek in Table 3-15?

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 3-16** **Lines #: NA**
Specific Comment #: 13

The second to last paragraph is confusing. Under what condition would the dam be removed but the lacustrine sediments left in place - why is this condition being referenced? Please delete if it is irrelevant.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 3-17** **Lines #: NA**
Specific Comment #: 14

Section 3.8.1.3 first paragraph. Why was the model not calibrated - do the model results match the observed data perfectly?
The process described here is validation not calibration. This section should be revised accordingly. And the model should not be described as calibrated.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 3-17** **Lines #: NA**
Specific Comment #: 15
Second to last paragraph – the report states:

> *"Channel n-values ranged from 0.02 to 0.07 and were applied based on prior work by the USGS in 2003 (Syed, 2005); for that investigation Manning n-values were calculated at each cross section based on observations at over 100 transects (cross-sections) on the Kalamazoo River in Areas 1, 2, 3, and 4."*

Please describe the specific method used to calculate Manning's n-values and the "observed" data for which it is based on.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 3-17 and Table 3-18** **Lines #: NA**
Specific Comment #: 16

Table 3-18 shows that an n-value of 2.0 was used for buildings. This is an order of magnitude above the acceptable range. And, there is no need to use such an unrealistic roughness values for buildings. The model resolution is good enough to represent the buildings in the grid which is the correct way to represent them. Using extreme roughness values will lead to unreliable hydraulic results in those areas.

Also, please add a citation for the reference used to assign floodplain roughness values to various vegetation types.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 3-18** **Lines #: NA**
Specific Comment #: 17

Section 8.3.1.3 – Model Calibration, needs a summary and discussion of results. The analysis is validation, not calibration, but a summary of findings is still needed.

There appears to be some discrepancy (around 1 foot) between the rating curve from the HEC-RAS model and the flow-stage measurements at OSG-1. If these were higher flow data and thus more meaningful, these results would suggest that revisions are needed to the downstream boundary condition.

A summary discussion should also describe the implications of not having any moderate to high flow data for calibration. The low flow data are of little to no use for the purposes of this model.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 3-18** **Lines #: NA**
Specific Comment #: 18

The results are not legible with the chosen symbology. Inundation extent is all that can be seen with a dull blue color palette and bathymetry contours that obscure the results. Please use a more distinctive color palette and remove the bathymetry contours.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 3-19 and Figures 3-28 – 3-31** **Lines #: NA**
Specific Comment #: 19

Please edit the symbology so the results can be seen more clearly. Suggested revision:

- Remove the bathymetry contours.
- Change the figure order so that the Existing Condition and No-Dam results for a given flow and parameter are next to each other. Then the reader can quickly flip between the two to see the changes.
- Add more high velocity bins - the largest bin is 5-15 fps. Results for the 100 YR event have a lot of areas in that 5-15 fps range and there's a huge difference between 5 and 15 fps.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 3-20** **Lines #: NA**
Specific Comment #: 20

Section 3.8.2.3 Bed Shear Stress. Second sentence states:

> *Bed shear stress is highest in areas where flow velocities are faster, depth is less, or flow velocity changes.*

Changes in flow velocity not directly affect bed shear stress. Bed shear is a function of velocity, flow depth, and bed roughness. Please correct the text.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 3-20** **Lines #: NA**
Specific Comment #: 21

Section 3.8.2.3 Bed Shear Stress. Forth sentence states:

> *Bed shear stress is consistently highest across the range of flows in the 0.4-mile long channel segment from RM 51.8 to 52.2. There is very little overbank, or floodplain, area in this segment and the channel cross section has steep banks on both sides, resulting in relatively high shear stresses compared to other channel segments in Area 3.*

The reason given for the high shear stresses between RM 51.8 and 52.2 is incorrect. The shear stresses are consistently high (too high) in this section because of the user prescribed Manning's roughness value of 0.07 which is too high. If the high shear stresses were being caused by concentrated flow, as described in the report, the velocities would be elevated in this reach but they are not. The area of high shear stress has clearly distinctive boundaries which align perfectly with the roughness mapping boundaries shown on Figure 3-17. DELFT3D uses the quadratic friction law to compute bed shear stress which is very sensitive to the user defined roughness values. An n-value of 0.07 is way too high for this type of channel bed. A value of 0.07 would be reflective of a steep mountain stream with large cobbles - not a low gradient river with a gravel bottom.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 3-20** **Lines #: NA**
Specific Comment #: 22

Section 3.8.2.3 Bed Shear Stress. Fourth paragraph states:

> *For downstream segments, shear stresses increase slightly in some locations as a result of dam removal and lowered water levels, but the effect is largely compensated by the removal of lacustrine sediments and a no dam channel morphology that is considered to be approximately in equilibrium with the flows.*

Two comments:

1) Revised text based on response to Specific Comment 1.
2) It appears that the channel roughness values for the no-Dam scenario are the same as those used for the existing condition. The roughness values should be higher in the lower reach of the No-Dam scenario since the substrate will change from a smooth silt/sand bed to a rough gravel bed. This is essential to this analysis because the roughness values drive the shear stress results. The bed shear stress should increase as a result of higher velocities (due to the steeper gradient) and increased channel roughness. You've only accounted for one of these affects.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 3-20** **Lines #: NA**
Specific Comment #: 23

Section 3.8.2.3 Bed Shear Stress. Second paragraph states:

> *Floodplain areas where flow enters from the channel or flows back into the channel are also locations where predicted shear stresses are higher.*

This is an odd model result - can you provide an explanation for this result? Do you believe it to be a real phenomena or a modeling artifact? You should be able to figure out why this is happening based on a close examination of the model inputs and results but it is difficult to tell from the PDFs due to the scale and color symbology chosen. I'm guessing it's caused by the intersection of high flow velocities in the channel and high roughness values defined for the banks. It's probably not a real phenomena but it should

be investigated since this zone of high shear stress is being predicted along the bank lines where PCB concentrations are relatively high.

Commenting Organization: USEPA **Commenter: White**
Section: 4.1.1 **Page #: 4-2** **Lines #: NA**
Specific Comment #: 24

Second paragraph: "*Approximately 74 percent had detections ...below 0.33 mg/kg...*" Should the word "detections" be replaced with "concentrations," or did 74 percent of the samples have detected concentrations below 0.33 mg/kg? Also, the phrase "*Maximum PCB concentrations are depicted...*" should be changed to "*The maximum PCB concentration at each sampling location...*"

Commenting Organization: USEPA **Commenter: White**
Section: 4.1.2 **Page #: Table 4-2** **Lines #: NA**
Specific Comment #: 25

Please clarify whether the samples from the Pine Creek impoundment are grouped with the downstream samples. If not, please add a summary of the Pine Creek impoundment data to this table.

Commenting Organization: USEPA **Commenter: White**
Section: 4.1.2 **Page #: 4-2** **Lines #: NA**
Specific Comment #: 26

Third paragraph: "*...the maximum concentration was 156 mg/kg in the surface interval at KPT 93-1 (RM 49.83)...*" This result is not shown in Figure 4-3a (unless the symbol is obscured). Also, this paragraph states that location KPT 93-1 is located 25 feet away from the right river bank. This should be changed to indicate that it is 25 feet away from the left river bank.

Commenting Organization: USEPA **Commenter: White**
Section: 4.1.2 **Page #: 4-3** **Lines #: NA**
Specific Comment #: 27

The first full paragraph indicates that the highest PCB concentration in the Pine Creek impoundment is 15-18 inches below the surface. This maximum concentration is shown in Figure 4-1b as being in the surface interval (in fact, all Pine Creek impoundment locations are shown with maximum concentrations in the surface interval).

Commenting Organization: USEPA **Commenter: White**
Section: 4.1.3 **Page #: 4-3** **Lines #: NA**
Specific Comment #: 28

Figures 4-2a and 4-2b are not cited. Additionally, these figures should be revised using a log scale for PCB concentration.

Commenting Organization: USEPA **Commenter: White**
Section: 4.1.3 **Page #: 4-3** **Lines #: NA**
Specific Comment #: 29

Second paragraph – "Figures 4-3a through 4-3f show maximum PCB concentrations for each of the following depth intervals…" Please explain what is meant by the maximum PCB concentration for each depth interval (this comment also applies to Section 4.2.3, first paragraph). For example, if two samples were collected within a given depth interval was the highest result used? Also, samples were collected from seven locations in the Pine Creek impoundment, but none of the maps in Figures 4-3a through 4-3f show seven locations.

Commenting Organization: USEPA **Commenter: White**
Section: 4.1.3 **Page #: 4-3** **Lines #: NA**
Specific Comment #: 30

Third paragraph, last sentence: "In the surface interval… one sample exceeded 50 mg/kg." This sample is not shown on Figure 4-3a.

Commenting Organization: USEPA **Commenter: White**
Section: 4.1.5 **Page #: 4-5** **Lines #: NA**
Specific Comment #: 31

The Pine Creek impoundment is not included in the development of SWACs. Average concentrations for each depth interval in the impoundment should be developed and presented in Section 4.1.5 and shown in Figures 4-5a through 4-5d.

Commenting Organization: USEPA **Commenter: White**
Section: 4.2.2 **Page #: Figures 4-8a and 4-8b** **Lines #: NA**
Specific Comment #: 32

PCB concentrations on these figures should be shown using a log scale.

Commenting Organization: USEPA **Commenter: White**
Section: 4.2.2 **Page #: 4-10** **Lines #: NA**
Specific Comment #: 33

First paragraph: "*One sample (SO-007)...exceeded 50 mg/kg.*" This sample is not shown with a red symbol in Figure 4-1a.

Commenting Organization: USEPA **Commenter: White**
Section: 4.2.2 **Page #: 4-10** **Lines #: NA**
Specific Comment #: 34

Second paragraph: "*Those locations with PCB concentrations exceeding 50 mg/kg were distributed...between RM 50.15 and 51.0.*" Soil samples with PCBs > 50 mg/kg were found both upstream and downstream of the segment from RM 50.15 and 51.0

Commenting Organization: USEPA **Commenter: White**
Section: 4.2.4 **Page #: 4-10** **Lines #: NA**
Specific Comment #: 35

Natural neighbor interpolation was used to map PCB concentrations in floodplain soils. However, this method does not consider geomorphology or PCB transport processes, leading to what are most likely inaccurate representations. For example, Figure 4-1b clearly shows a band of maximum PCB concentrations of greater than 50 mg/kg in the floodplain north of the Pine Creek impoundment. This band corresponds with a lower elevation wetland area (possibly a relict channel) bordered on either side by floodplain forest, but the natural neighbor interpolation shows a PCB distribution that is inconsistent with the topography and geomorphology in this area. These interpolations also show PCB concentrations of greater than 50 mg/kg at the outer boundary of the study area, which is probably not accurate. The method used to map PCB distribution in floodplain soils should be revised to be consistent with geomorphic and topographic features.

Commenting Organization: USEPA **Commenter: White**
Section: 4.3.1 **Page #: 4-13** **Lines #: NA**
Specific Comment #: 36

The second paragraph indicates that surface water data set includes both PCB Aroclor and congener data. Table 4-7 should indicate whether samples in each data set were analyzed for Aroclors or congeners. It is not clear whether Aroclor and congener data were pooled for data analysis, but they should not be pooled unless it can be demonstrated that total PCB concentrations quantified as Aroclors and congeners are equivalent.

Commenting Organization: USEPA **Commenter: White**
Section: 4.3.1 **Page #: Figure 4-11** **Lines #: NA**
Specific Comment #: 37

PCB concentrations should be shown using a log scale.

Commenting Organization: USEPA **Commenter: White**
Section: 4.3.1 **Page #: 4-14** **Lines #: NA**
Specific Comment #: 38

The third paragraph: please state the purpose of the regression analyses and statistical evaluations that could not be performed due to data limitations.

Commenting Organization: USEPA **Commenter: White**
Section: 4.3.1 **Page #: 4-14** **Lines #: NA**
Specific Comment #: 39

Fourth paragraph: "*The mean flows at the Otsego City Dam...do not appear to correlate with mean PCB concentrations*." Please reference the tables, figures, or appendices that

support this conclusion. Also, the slope and R2 value cited in this paragraph are not consistent with the values shown in Figure 4-12.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 5-2** **Lines #: NA**
Specific Comment #: 40
Section 5.1.2.1 Bank Erosion. Second sentence states:

> *"...banks tend to erode during floods and accumulate sediment as point bars during recession of high and moderate flows. In sinuous and meandering streams, bank erosion is most often focused on the outside of a meander bend, with the eroded sediment from one bank typically being deposited downstream, on the inside of the meander bend to form a point bar."*

This idealized description of a classic meandering river migration is not applicable to this site, as can be seen in the data. This narrative should be updated with a description of the relevant mechanisms and processes at this site (i.e. freeze thaw, wetting \drying, and basal toe erosion, etc.).

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 5-5** **Lines #: NA**
Specific Comment #: 41

Section 5.1.3 Sediment and Soil Characteristics. Second paragraph states:

> *Floodplain soil samples in Area 3 are composed mostly of silts with fine sands. For the 129 soil samples with grain size data in the top sample interval, 75 percent of locations had more than 45 percent fines (passing #200 sieve, percent finer than 0.075 mm), and 50 percent of locations had more than 65 percent fines.*

These data clearly show very high percentages of fines in the floodplain which means they are highly cohesive. The preceding paragraphs describe the general behavior of cohesive sediments and why that is important but there's no follow-up stating whether cohesive sediment exist in this reach and they clearly do, and that's very important to document.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 5-5** **Lines #: NA**
Specific Comment #: 42

Section 5.1.3 Sediment and Soil Characteristics. Second paragraph states:

> *Sediment samples were generally coarser, composed of fine to medium sands with fewer fines.*

Is there a missing descriptive word at the beginning of this sentence? What samples are being referred to here? Perhaps sub-surface floodplain samples or surficial samples within the channel? Please clarify.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 5-5** **Lines #: NA**
Specific Comment #: 43

Second to last paragraph. Text states:

> *A previous sediment transport model for the Kalamazoo River (Syed et al., 2005) suggests that most of the river's sediment transport processes are in a state of dynamic equilibrium.*

Isn't this in direct conflict with the conclusion found from the erosion pin data which show historic and continued net erosion? A 1D sediment transport model cannot account for all the sediment transport processes (i.e. bank erosion for example). This text should have a caveat or two.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 5-8** **Lines #: NA**
Specific Comment #: 44

Section 5.3 Conceptual Site Model. Third paragraph states:

> *The ongoing sources are expected to be limited to suspended sediments from the Otsego City Dam, non-point sources, and atmospheric deposition. There are no known, ongoing, point sources of PCBs in Areas 1, Area 2, or Area 3.*

What does "suspended sediment from the Otsego City Dam" mean?

And, why is there no mention of bank erosion as an ongoing source?

Commenting Organization: USEPA **Commenter: White**
Section: 5.3 **Page #: 5-8** **Lines #: NA**
Specific Comment #: 45

Third paragraph: "*...ongoing sediment sources into Area 3 are expected to be limited.*" The rest of this paragraph appears to be addressing PCB sources rather than sediment sources. Also, should the phrase "*suspended sediments from the Otsego City Dam*" be revised to read "*suspended sediments from upstream of the Otsego city Dam*" (emphasis added)?

Commenting Organization: USEPA **Commenter: White**
Section: 5.3 **Page #: 5-8** **Lines #: NA**
Specific Comment #: 46

First bullet under Distribution of PCBs: "*PCB concentrations tend to be highest…within the top sample layers.*" Please replace "top sample layers" with the soil depth interval (i.e., top 2 feet).

Commenting Organization: USEPA **Commenter: White**
Section: 5.3 **Page #: 5-9** **Lines #: NA**
Specific Comment #: 47

Distribution of PCBs: the distribution of PCBs in the Pine Creek Impoundment should be included in this summary.

Commenting Organization: USEPA **Commenter: White**
Section: 5.3 **Page #: 5-10** **Lines #: NA**
Specific Comment #: 48

First bullet, second sentence: please revise the text to clarify the meaning of the phrase "*but these surfaces have not been delineated for Area 3.*"

Commenting Organization: USEPA **Commenter: White**
Section: 5.3.1 **Page #: 5-10** **Lines #: NA**
Specific Comment #: 49

The CSM cross sections are useful and informative. However, the representation of the distribution of PCBs in floodplain soils may be inaccurate because the nearest neighbor interpolation does not account for PCB transport patterns (i.e., geomorphology; elevation). As previously noted, the inaccuracies may be most pronounced in the depiction of PCB distribution in the floodplain north of the Pine Creek Impoundment.

Commenting Organization: USEPA **Commenter: White**
Section: 5.3.1 **Page #: 5-10** **Lines #: NA**
Specific Comment #: 50

One of the CSM cross sections should extend through the Pine Creek Impoundment.

Commenting Organization: USEPA **Commenter: White**
Section: 5.3.1 **Page #: 5-11** **Lines #: NA**
Specific Comment #: 51

First full paragraph, last sentence: "*…the vertical extent of the profile was constrained to the 10-year flood event using the Otsego Dam elevation at its operational height…*" please revise to clarify the meaning of this sentence.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 5-11 through 5-13** **Lines #: NA**
Specific Comment #: 52

Section 5.3.2 Potential Mobilization of PCBs. Three comments related to the incipient motion analysis described on pages 5-11 through 5-13.

1) The approach used for incipient motion analysis is overly simplistic and is only applicable to sediment sizes larger than a medium sand. For smaller fractions the coefficient would range from 0.5 to 4 for a fine silt (compared to the constant value of 0.785 selected). The standard approach for incipient motion analysis is to use the Shields parameter.

2) This analysis should only be performed on sediments in the river bed. It is not appropriate for assessing the mobility of cohesive floodplain sediments that are covered by vegetation.

3) This analysis cannot be used to determine the equilibrium d50. This analysis is valuable but only in a relative sense - that is comparing the dam-in and dam-out conditions. But, it's a step too far to say that the particle size associated with incipient motion should be the equilibrium d50. We'd expect nearly the entire substrate to be mobilized during a 2YR flood but that doesn't mean the bed is out of equilibrium, or that there is something wrong with the model results. Limit the interpretations to relative comparisons. Many of the interpretations listed are not valid.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 5-13** **Lines #: NA**
Specific Comment #: 53

In Section 5.4 the last sentence states:

> *As discussed previously, the hydrodynamic model predicts bed shear stresses at values higher than actually experienced. Therefore, this evaluation is performed on a relative basis.*

This has not been proven - the previous statements are based on flawed reasoning. Please revise the text.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 5-13** **Lines #: NA**
Specific Comment #: 54

Section 5.4.1, second paragraph:

> *In a dam-out scenario, shear stresses are predicted to be similar to the dam-in scenario throughout Area 3. Shear stresses increase slightly in the downstream subarea ranging between 1 N/m2 and 10 N/m2 (Figures 5-14a and 5-14b).*

The post-dam shear stress values would be even higher if the bed roughness were adjusted more realistically. One reason that they are similar is because the roughness values were not increased to reflect the change from a sand bed to a gravel bed following dam removal.

Commenting Organization: USEPA **Commentor: Mitchell**
Section: **Page #: 5-13** **Lines #: NA**
Specific Comment #: 55

Section 5.4.2

Correct the text describing the reason for the high shear stress predicted between RM51.8 and 52.0. See comment X.

Commenting Organization: USEPA **Commenter: White**
Section: 6.1.6 **Page #: 6-5** **Lines #: NA**
Specific Comment #: 56

Change all of the references to Appendix H to Appendix J.

Commenting Organization: USEPA **Commenter: White**
Section: 7.1 **Page #: 7-2** **Lines #: NA**
Specific Comment #: 57

First paragraph, last sentence: "*…therefore, the model outcomes may be over-predicted for these events.*" Replace "may be over-predicted" with "are less certain."